

Fact vs. Fiction: How Do You Improve the Energy Performance of a Building?

Fiction:

People often think that the only way to make an existing commercial building energy efficient is through expensive capital investments as well as large equipment and technology upgrades.

Fact:

EPA's experience with thousands of organizations and hundreds of thousands of buildings has shown that technology alone doesn't deliver an efficient building, it actually requires changes to how a building is operated and maintained—as well as the behaviors of its tenants.

Let's examine this fact versus fiction story a little further.

Smooth Operator

We've all seen them—those buildings with all the lights on at 9 p.m. on a Sunday night while the only occupants may be a quiet family of (rather unwelcome) mice. It's a tell-tale sign of poor operations, and a likely signal that other systems in the building, such as heating and air conditioning, are not governed by a sound operational plan. And there's a cost-effective solution: motion and occupancy sensors ensure that lights are only used when needed. Paired with upgrades to energy-efficient lighting, operational changes such as these can make a big difference.

Well-Oiled Machines

Just like a car, a building needs regular maintenance to make sure systems are running smoothly and efficiently. Is there a damper stuck in the 'open' position, letting conditioned air escape outside? Does a routine inspection reveal a faltering piece of equipment that needs to be replaced? Are the air handler units operating properly, or are the settings incorrect? A regular maintenance schedule catches problems, allows for quick replacement of failing equipment, and ensures that the building is operating as intended. Without it, any building owner could be wasting energy and money without even realizing there is a problem.

A Team Effort

Of course, everyone in the building has a role to play in the quest to save energy. Even if facility managers have a building set up as a model of efficiency, there is still the possibility of wasted energy if individuals leave lights on in empty rooms, keep mini-refrigerators stashed under their desks, bring in accent lamps with incandescent bulbs, or leave their computers running all day and night. Energy-efficient buildings rely on their occupants to use the same good behaviors at work that they use at home. To help educate tenants, many building owners and managers distribute informational posters or flyers, host energy fairs in the building lobby, and include energy-saving tips in newsletters. Also remember that you can learn from your tenants. You should provide them with opportunities to offer feedback on a regular basis. For example, if many tenants have space heaters under their desks, perhaps there is a problem with the heating distribution

system. Input from building occupants can also be vital to ensuring that building systems are operating as intended. When everyone in a building pitches in to eliminate wasted energy, a building can realize significant savings.

Taking It to the Next Level

Operational, maintenance, and behavioral changes such as those discussed above can capture up to 30% of the energy inefficiencies found in commercial buildings. That said, there is a time and place for capital investments in new, more efficient technology and equipment. That time and place occur when the efficiency of a building has been maximized through operational and maintenance improvements and when the natural lifecycle of equipment and technology has been met. It doesn't make sense to upgrade to a new energy-efficient chiller before you have made lighting and equipment as efficient as possible—these smaller upgrades will lower your cooling load. After you've lowered the load you can consider a more efficient (and properly sized) piece of equipment. It also isn't effective to purchase a new, more energy-efficient boiler when the existing boiler is only a year old. Properly timing capital investments and equipment upgrades and considering them in light of the overall operations and maintenance of a facility are essential for these changes to be cost-effective and to result in improved energy efficiency.